Alcohol increases reaction time and errors during decision making

October 19 2010

There has been an abundance of research on the effects of alcohol on the brain, but many questions regarding how alcohol impairs the built-in control systems are still unknown. A new study released in the January 2011 issue of *Alcoholism: Clinical & Experimental Research*, which is currently available at Early View, explores that subject in detail and found that certain brain regions involved in error processing are affected more by alcohol than others.

According to Beth Anderson, a postdoctoral fellow at the Olin Neuropsychiatry Research Centre at Hartford Hospital in Connecticut and lead author of the paper, this research is only the first step in a much larger process."Alcohol is widely consumed in our society today. We know it alters behavior, but surprisingly it is not well studied at the brain level. Once we understand how it is altering the brain, we can better inform the public of the consequences of drinking alcohol."

The researchers gave 38 volunteers different doses of alcohol to establish a breath alcohol concentration of zero for the control group, 0.5 per cent for moderate intoxication, or 0.1 per cent for a high level of alcohol intake. Then, once the alcohol was given enough time to cause intoxication, the volunteers participated in a Go/No-Go reaction test, where either the letters "K" or "X" were displayed on a screen with specific instructions to only press a button when an "X" was displayed.

In the experiment, there was no significant data between the control and moderate intoxication, but there were some very interesting results

discovered between the control and high dose testing. After receiving the highest level of alcohol, individuals were found to have an increased reaction time, more errors and an overall decrease of successful trials.

According to Anderson, the lack of data regarding the moderate doses of alcohol was likely due to the fact that the participants were able to partially compensate for the effects of the alcohol. However, following the higher dose, individuals would have had a much more difficult time achieving that. "The increased reaction time was likely an attempt to compensate for their impairment. They may have slowed down in an attempt to keep from making more errors."

However, these results still yield more questions regarding the mystery of how alcohol impairs the control centers of the brain, and only more research will be able to help solve this complicated problem.

"We know [alcohol] alters behavior, but surprisingly, it is not well studied at the brain level," Anderson said. "Once we understand how it is altering the brain, we can better inform the public of the consequences of drinking alcohol."

Provided by Alcoholism: Clinical & Experimental Research